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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/593,872	05/18/2007	Shunsuke Fujita	2006-1602A	5843
513 7590 08/03/2010 WENDEROTH, LIND & PONACK, L.L.P. 1030 15th Street, N.W., Suite 400 East Washington, DC 20005-1503				
EXAMINER				
LEE, NATHANIEL J.				
ART UNIT		PAPER NUMBER		
2889				
NOTIFICATION DATE		DELIVERY MODE		
08/03/2010		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ddalecki@wenderoth.com  
coa@wenderoth.com

### Office Action Summary

**Application No.**

10/593,872

**Applicant(s)**

FUJITA ET AL.

**Examiner**

NATHANIEL J. LEE

**Art Unit**

2889

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 May 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/GS/US)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. The amendment filed on May 12, 2010 has been entered.

### ***Response to Arguments***

2. Applicant's arguments filed May 12, 2010 have been fully considered but they are not persuasive. (note: new grounds of rejection were necessitated by amendment; however, since the new rejections use the same references in substantially the same way, applicant's arguments are applicable to the new grounds as well).
3. Applicant amended claim 1 to remove the requirement that the inorganic material and the crystallized glass are separate materials while adding the requirement that the inorganic material is of a crystallized glass. Claim 1 as amended therefore is directed to a crystallized glass which is capable of being used as a phosphor which converts an excitation light to a fluorescence light of a complimentary color and partially transmitting the excitation light through the phosphor. As the examiner noted in prior actions, Reeh does not teach crystallized glass and is therefore inapplicable to the claim as written, therefore the question of patentability rests on whether the crystallized glass taught by Celikkaya is capable of being used as a phosphor.
4. In response to the question of whether Celikkaya's crystallized glass meets the requirements of the claim, applicant argues that Celikkaya does not disclose the intention of using the crystallized glass as a phosphor, a fact which the examiner readily

agrees to. However, the crystallized glass of Celikkaya may be Yttrium Aluminum Garnet (YAG) (paragraph 121) and may be doped with Cerium (also paragraph 121), so an embodiment of Celikkaya's crystallized glass is therefore YAG:Ce, which is a well known phosphor and, as evidenced by Reeh (paragraph 109), YAG:Ce is capable of, when exposed to a blue excitation light, producing a yellow light which is complementary to the blue excitation light resulting in white light, and allows a portion of the excitation light to transmit through the phosphor. Celikkaya's crystallized glass therefore inherently anticipates all the limitations (both structural and those implied by the intended use) of claim 1 as amended.

5. Applicant argues that one of ordinary skill in the art would have no motivation to combine Celikkaya and Reeh. The examiner respectfully disagrees. Both Celikkaya and Reeh provide motivation to make the combination: Reeh identifies YAG:Ce (which is what Celikkaya's crystallized glass is made of) as a preferred phosphor composition, noting that YAG:Ce enjoys the advantages of higher luminous efficiency and high thermal and photochemical stability when compared to other luminescent materials (Reeh paragraph 62). Celikkaya additionally notes that crystallized glasses are stronger than noncrystallized glass (Celikkaya paragraph 112), which would additionally motivate one of ordinary skill in the art to use Celikkaya's crystallized YAG:Ce rather than alternative forms.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1 and 4-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Celikkaya et al. (US 2005/0056055 A1), hereinafter Celikkaya, as evidenced by Reeh et al. (US 2001/0000622 A1), hereinafter Reeh.

8. With respect to claim 1: Celikkaya discloses "an inorganic material of a crystallized glass (paragraphs 119-121)".

9. Celikkaya's crystallized glass may be YAG:Ce (paragraph 121) which is a phosphor having the inherent property, as evidenced by Reeh paragraph 109, that "when an excitation light (Reeh paragraph 109) including visible light (Reeh paragraph 109) is irradiated on the phosphor (Reeh paragraph 109), the phosphor emits a fluorescence of complimentary color (Reeh paragraph 109) with respect to a hue of the excitation light (Reeh paragraph 109), and a portion of the excitation light transmits through the phosphor (Reeh paragraph 109)".

10. With respect to claim 4: As evidenced by Reeh, Celikkaya's crystallized glass inherently has the properties with respect to excitation and fluorescence light noted above "wherein the excitation light including visible light is a light of which a center wavelength is between 430 to 490nm (Reeh paragraph 109), and the fluorescence is a light of which a center wavelength is between 530 to 590nm (Reeh paragraph 109)".

11. With respect to claim 5: Celikkaya discloses "wherein the crystallized glass includes  $\text{Ce}^{3+}$  (paragraph 121) and a precipitated garnet crystal (paragraph 121)".
12. With respect to claim 6: Celikkaya discloses "wherein the garnet crystal is YAG crystal or YAG crystalline solid solution (paragraph 121)".

***Claim Rejections - 35 USC § 103***

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 2, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Celikkaya as applied to claim 1 above, and further in view of Reeh.
15. With respect to claim 2: Celikkaya does not specifically teach "wherein the phosphor has a panel shape".
16. However, Reeh teaches the material of Celikkaya's crystallized glass ( $\text{YAG}:\text{Ce}$ ) used as a phosphor "wherein the phosphor (6 (Fig. 3)) has a panel shape (see Fig. 3)".
17. It would have been obvious at the time of the invention for one of ordinary skill in the art to use Celikkaya's crystallized glass as a panel shaped phosphor as taught by Reeh in order to enjoy the advantages of higher luminous efficiency and high thermal and photochemical stability when compared to other luminescent materials (Reeh paragraph 62).

18. With respect to claim 11: Celikkaya teaches "the phosphor according to claim 1 (see claim 1 above)".
19. Reeh teaches "a light-emitting diode (1 (Fig. 3))".
20. It would have been obvious at the time of the invention for one of ordinary skill in the art to use the crystallized glass of Celikkaya as the phosphor in the light emitting diode taught by Reeh in order to enjoy the advantages of higher luminous efficiency and high thermal and photochemical stability when compared to other luminescent materials (Reeh paragraph 62).
21. With respect to claim 12: Celikkaya teaches "the phosphor according to claim 1 (see above)".
22. Reeh teaches "a light-emitting diode (1 (Fig. 3)) comprising: a stem (2, 3 (Fig. 3)) including a cathode lead terminal (3 (Fig. 3)) and an anode lead terminal (2 (Fig. 3)), a light-emitting diode chip (1 (Fig. 3)) connected to the anode lead terminal (see Fig. 3), a metal wire connecting the cathode lead terminal and the light-emitting diode chip (14 (Fig. 3)), a housing vessel (8 (Fig. 3)) that is fixed such that the stem and the light-emitting diode chip are air-tightly sealed (paragraphs 92-93), and including a window portion (see Fig. 3) disposed above the light-emitting diode chip (see Fig. 3), and the phosphor (6 (Fig. 3)) attached to the window portion of the housing vessel (see Fig. 3)".
23. It would have been obvious at the time of the invention for one of ordinary skill in the art to use the crystallized glass of Celikkaya as the phosphor in the light emitting diode taught by Reeh in order to enjoy the advantages of higher luminous efficiency and

high thermal and photochemical stability when compared to other luminescent materials (Reeh paragraph 62).

24. Claims 3, and 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Celikkaya and Reeh as applied to claims 1, 2 and 5 above, and further in view of Maegawa (US 2002/0171911 A1), hereinafter Maegawa.

1. With respect to claim 3: Celikkaya and Reeh do not specifically teach "wherein the phosphor has a wall thickness between 0.1 mm to 2 mm".
2. However, Maegawa teaches a YAG:Ce phosphor (paragraph 11) similar to the material of Celikkaya's crystallized glass, used in an LED in a manner similar to Reeh "wherein the phosphor has a wall thickness between 0.1 mm to 2 mm (paragraph 11)".
3. It would have been obvious at the time of the invention for one of ordinary skill in the art to form the phosphor taught by Celikkaya in view of Reeh to the thickness taught by Maegawa in order to adjust the hue of the LED in order to obtain white light (Maegawa paragraph 11).
4. With respect to claim 7: Celikkaya and Reeh do not specifically teach "further including 0.01 to 5 mol% of  $\text{Ce}_2\text{O}_3$ ".
5. However, Maegawa teaches a YAG:Ce phosphor (paragraph 11) similar to the material of Celikkaya's crystallized glass, used in an LED in a manner similar to Reeh "further including 0.01 to 5 mol% of  $\text{Ce}_2\text{O}_3$  (paragraph 24)".



6. It would have been obvious at the time of the invention to further modify the phosphor of Reeh in view of Celikkaya with the cerium concentration taught by Maegawa in order to activate the phosphor (Maegawa paragraph 24).

7. With respect to claim 8: Celikkaya teaches "wherein the crystallized glass has a glass composition including 10 to 60mol% of  $\text{SiO}_2 + \text{B}_2\text{O}_3$  (paragraph 14), 15 to 50mol% of  $\text{Al}_2\text{O}_3 + \text{GeO}_2 + \text{Ga}_2\text{O}_3$  (paragraph 14), 5 to 30mol% of  $\text{Y}_2\text{O}_3 + \text{Gd}_2\text{O}_3$  (paragraph 123), 0 to 25mol% of  $\text{Li}_2\text{O}$  (paragraph 91), 0 to 15mol% of  $\text{TiO}_2 + \text{ZrO}_2$  (paragraph 92)".

8. Maegawa teaches "0.01 to 5mol% of  $\text{Ce}_2\text{O}_3$  (paragraph 24)".

9. It would have been obvious at the time of the invention to modify the crystallized glass of Celikkaya by adding cerium in the amount taught by Maegawa in order to activate the phosphor (Maegawa paragraph 24).

10. With respect to claim 9: Celikkaya teaches "further including essentially no  $\text{TiO}_2$  and  $\text{ZrO}_2$  (paragraph 6)".

11. Note: Celikkaya specifies that the  $\text{TiO}_2$  and  $\text{ZrO}_2$  are optional, which means that leaving them out is also an option.

12. With respect to claim 10: Celikkaya teaches "wherein the crystallized glass has a glass composition including 10 to 50mol% of  $\text{SiO}_2$  (paragraph 14), 15 to 45mol% of  $\text{Al}_2\text{O}_3$  (paragraph 14), 5 to 30mol% of  $\text{Y}_2\text{O}_3$  (paragraph 123), 0 to 15mol% of  $\text{GeO}_2$  (paragraph 58), 0 to 20mol% of  $\text{Gd}_2\text{O}_3$  (paragraph 121), 0 to 15mol% of  $\text{Li}_2\text{O}$  (paragraph 91), 0 to 30mol% of  $\text{CaO} + \text{MgO} + \text{Sc}_2\text{O}_3$  (paragraph 91)".

13. Note: Any optional ingredients taught by Celikkaya (everything except the  $\text{SiO}_2$  and  $\text{Al}_2\text{O}_3$ ) is embodied at least by the 0 mol% case, as well as any other specific embodiments taught by Celikkaya.

14. Maegawa teaches "0.01 to 5mol% of  $\text{Ce}_2\text{O}_3$  (paragraph 24)".

15. It would have been obvious at the time of the invention to modify the crystallized glass of Celikkaya by adding cerium in the amount taught by Maegawa in order to activate the phosphor (Maegawa paragraph 24).

### ***Conclusion***

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NATHANIEL J. LEE whose telephone number is (571)270-5721. The examiner can normally be reached on Monday-Thursday, 8:00 a.m.-5:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minh Toan Ton can be reached on (571)272-2303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/NATHANIEL J LEE/  
Examiner, Art Unit 2889

/Bumsuk Won/  
Primary Examiner, Art Unit 2889